

ACCESSION NR: ARA020755

S/0169/64/000/001/B067/B067

SOURCE: RZh. Geofizika, Abs. 1B374

AUTHOR: Vangengeym, G. Ya.

TITLE: Calculation of the intensity of air currents for the diagnosis and prognosis of the characteristics of atmospheric circulation and weather forecasting

CITED SOURCE: Tr. Arkt. i Antarkt. n.-i. in-ta, v. 253, 1963, 21-32

TOPIC TAGS: Air current intensity, meridional gradient, latitudinal gradient, atmospheric circulation form, atmospheric temperature field, weather forecasting

TRANSLATION: Calculation of the intensity of air currents was based on Vangengeym's circulation forms over the northern hemisphere divided into 8 sectors. The circulation intensity was determined by constructing meridional and latitudinal gradients whose values, plotted on a graph, characterize the

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intensity of zonal and meridional transports over the entire hemisphere.

Comparison of the circulation intensity for various forms, genesis and stage of development of the circulation explains the intensity and the localization of temperature fields (as the deviation from the standard). For example, at the depression stage of a given circulation form, the temperature field typical of this stage has a lower intensity, i.e., a lesser value of the temperature anomaly and a smaller extent of the source regions than the stage of the optimum development of this form. The relationships observed, confirmed statistically by a 42-year series of observations, make it possible to refine the forecast of meteorological elements which is based on the forecast of transformations of circulation forms.

L. Klimenko

DATE ACQ: 03Mar64

SUB CODE: AS

ENCL: 00

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SOURCE: Leningrad. Arkticheskiy i antarkkticheskiy nauchno-issledovatel'skiy institut.  
... imeni V. V. Prokhorova, voprosy

atmosphere. virtually no ... the fact that the role of this ...

of processes. procedures in the system

... matters of importance in long-range

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has a figure and a table.

**"APPROVED FOR RELEASE: 08/31/2001**

**CIA-RDP86-00513R001858520020-0**

**APPROVED FOR RELEASE: 08/31/2001**

**CIA-RDP86-00513R001858520020-0"**

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VARGHESE, G. Ya. [deceased]

Calculation of the intensity of air currents for diagnosing and forecasting the characteristics of atmospheric circulation and weather. Izudy ANII 253:21-33 '63.



**VANGENGHEYM, K.A.**

Role of somatic diseases in appearance of psychoses [with summary in French]. Zhur.nevr. i psikh. 57 no.3:341-350 '57. (MLRA 10:6)

1. Kafedra psikhiiatrii (zav. - prof. K.A.Vangengeym) Sverdlovskogo meditsinskogo instituta.  
(PSYCHOSES, etiology and pathogenesis,  
(Rus))

VANGENGEM, K.A.; DVALIDZE, Yu.F.; PILENKOVA, G.A.; UDINTSEV, N.A.

Effect of glutamic acid on the convulsions complicating insulin hypoglycemia. Sov. Med. 26 no.11:89-95 N'62

(MIRA 17:3)

1. Iz kafedry psikhiatrii (zav. - prof. K.A. Vangengeym) i kafedry biokhimii (zav. - prof. S.A. Braylovskiy) Sverdlovskogo meditsinskogo instituta i Sverdlovskoy psikhonevrologicheskoy bol'nitsy No.1 (glavnyy vrach P.M.Zhelobov).

VANGENGEYM, Kira Alekseyevna; KISELEV, A.S., red.; LYUDKOVSKAYA, N.I.,  
tekh. red.

[Somatogenic psychoses] Somatogennye psikhozy. Moskva, Medgiz,  
1962. 165 p. (MIRA 15:4)  
(MEDICINE, PSYCHOSOMATIC) (PSYCHOSES)

VANGENCEY, M. E. inzh; VERBITSKIY, M. Ye., inzh

Trouble in the performance of impulse safety devices of the TP-230-2  
boiler. Elek. sta. 29 no. 9:73-75 S '58. (MIRA 11:11)  
(Boilers--Safety measures)

VANGENGEMY, M.F.

AID P - 2536

Subject : USSR/Electricity

Card 1/1 Pub. 26 - 20/32

Author : Vangengeym, M. F., Eng.

Title : ~~XXXXXXXXXXXXXXXXXXXX~~  
Experience with starting boilers

Periodical : Elek sta, 6, 47-48, Je 1955

Abstract : The author discusses some defects in the boiler design and makes suggestions for certain improvements. He presents three different designs for steam-mazout conduits in a diagram and suggests the type to be used. He maintains that his suggestions would speed up mounting and installation and improve the operation of boilers. Three diagrams.

Institution : None

Submitted : No date

USSR/Physics - Solubility of Ag-Cu

FD-902

Card 1/1            Pub 153-11/26

Author            : Arkharov, V. I., Vangegeym, S. D., Magat, L. M. and Polikarpova, I. P.

Title             : Solubility of silver and copper in presence of small admixtures of beryllium or iron

Periodical        : Zhur. tekhn. fiz. 24, 1247-1253, Jul 1954

Abstract          : Study lattice parameters of solid solutions of various composition using x-ray techniques. Results confirm former assumptions on the mechanism governing the effect of admixtures on kinetics of aging. Kinetics are based on internal adsorption of admixtures. Five references Arkharov et al. Tables; graphs.

Institution       : --

Submitted        : December 15, 1953

137-58-5-10445

VANGENGEYM, S.D.

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 5, p 223 (USSR)

AUTHORS: Arkharov, V.I., Vangengeym, S.D.

TITLE: An Investigation of Internal Intergranular Adsorption in Alloys by Means of the Reversible Changes Occurring in the Lattice Parameter with Changes in Alloy Grain Size (Issledovaniye mezhkristallitnoy vnutrenney adsorbtsii v splavakh po obratnym izmeneniyam parametra reshetki pri izmenenii velichiny zerna splava)

PERIODICAL: V sb.: Issled. po zharcprochn. splavam. Vol 2. Moscow, AN SSSR, 1957, pp 125-130

ABSTRACT: Alloys of Ag with Tl, Be, and Zn are investigated. It is shown that when alloy grain size changes, reversible changes in lattice spacing occur, indicating the presence of intergranular internal adsorption in these alloys.

L. V.

1. Silver alloys--Adsorptive properties
2. Crystals--Lattices
3. Grains (Metallurgy)--Metallurgical effects

Card 1/1

AUTHORS: Arkharov, V. I. and Vangengeym, S. D.

126-3-7/34

TITLE: X-ray investigation of the inter-crystallite internal adsorption in silver base alloys. (Rentgenograficheskoye issledovaniye mezhkristallitnoy vnutrenney adsorbtsii v splavakh na osnove serebra).

PERIODICAL: "Fizika Metallov i Metallovedeniye " (Physics of Metals and Metallurgy), 1957, Vol.4, No. 3, pp. 439-446 (U.S.S.R.)

ABSTRACT: The reversible changes in the parameter of the lattice of a solid solution during changes in the grain size can be utilised for investigating the inter-crystallite internal adsorption in alloys. It is necessary that the coarsening and the breaking up of grains is effected alternately on the same specimen since only in this case can it be ensured that the change in the lattice parameter is not due to secondary causes (burning off of an admixture during heat treatment or liquation non-uniformities in the original ingot). In an earlier paper the author has utilised this method for investigating the inter-crystallite internal adsorption of Sb, Be and Fe in copper and, from measured reversible changes of the lattice parameters of the alloy during measuring of the grain size, conclusions were arrived at on the positive inter-crystallite internal adsorption of Sb and Be in copper.

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126-3-7/34

X-ray investigation of the inter-crystallite internal adsorption in silver base alloys. (Cont.)

In solid solutions containing two or three admixtures inter-crystallite internal adsorption took place predominantly by one of them, depending on the ratio of their concentration in the alloy. It was also found that, depending on the composition of the alloy, the thickness of the inter-crystallite transient zone varied between 350 and 900 Å. In this paper X-ray investigations are made of the inter-crystallite internal adsorption in systems specially selected and an evaluation is made of the width of the intercrystallite transient zones on the basis of measurement of the lattice parameter in fine and coarse grain states of the alloy. The experiments were made on the binary systems Ag-Tl, Ag-Be, Ag-Zn, Ag-Bi and Ag-Pb. Table 1, p.440 lists some of the characteristics of the components of these systems and Table 2, pp.441-444 lists the changes in the lattice parameter caused by the changes in the grain size. Reversible changes in the lattice parameter during changes in the grain size were observed in specially selected silver base alloys containing various admixtures. The sign of the changes in the lattice parameters indicates positive intercrystallite internal adsorption of Tl, Be, Zn, Bi and lead in silver.

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126-3-7/34

X-ray investigation of the inter-crystallite internal adsorption in silver base alloys. (Cont.)

If two of the above enumerated horophilic admixtures are contained in an alloy, one of them will be subjected to preferential internal adsorption. For various concentration ratios of the horophilic elements in Ag-Tl-Be, thallium will be subjected to preferential adsorption even if the concentration of Be is relatively higher. There are 2 tables and 12 references, 9 of which are Slavic.

SUBMITTED: January 17, 1957.

ASSOCIATION: Chair of Solid Body Physics, Ural State University  
imeni A. M. Gorky. (Kafedra Fiziki Tverdogo Tela Ural'skogo  
Card 3/3 Gosudarstvennogo Universiteta imeni A. M. Gor'kogo).

AVAILABLE: Library of Congress

VANGENGHEYM, S. D.

AUTHORS: Arkharov, V. I. and Vangengeym, S. D.

126-3-8/34

TITLE: On the factors influencing internal adsorption in solid solutions. (K voprosu o faktorakh, vliyayushchikh na effekt vnutrenney adsorbtsii v tverdykh rastvorakh).

PERIODICAL: "Fizika Metallov i Metallovedeniye" (Physics of Metals and Metallurgy), 1957, Vol.4, No.3, pp. 447-449, (U.S.S.R.)

ABSTRACT: According to earlier work of the author (1), a stimulus for internal adsorption is the tendency of the system of atoms forming the solid solution to reduce the excess energy possessed by structural non-uniformities, by regrouping. A particular case of internal adsorption is intercrystallite internal adsorption. If the dissolved component is horophilic it will lead to an enrichment of the intercrystallite transient zones by this component; this enrichment will not exceed a certain limit and will not in itself lead to the evolution of a new phase. The experimental material accumulated so far is inadequate for formulating theoretical horophilicity criteria in concrete systems of alloys. In the general formulation of the problem it can be assumed that for a small concentration of the dissolved component, as compared to the solubility, a factor favouring adsorption is the larger local distortion in the lattice, i.e. a large deviation of the ratio of the atomic radii from unity. The effect of internal adsorption in a

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On the factors influencing internal adsorption in solid  
solutions. (Cont.)

126-3-8/34

concrete system of alloys and its change with changing temperature is determined by the combination of the following: the adsorption "capacity" of the structural non-uniformity; the "preparation for separating out" of the dissolved component; the "geometrical" factor in the difference in atomic radii; the "chemical" factor; the thermal motion.

There are 9 references, 6 of which are Slavic.

SUBMITTED: January 17, 1957.

ASSOCIATION: Chair of Solid Body Physics Ural State University  
imeni A. M. Gorky. (Kafedra Fiziki Tverdogo Tela Ural'skogo  
Card 2/2 Gosudarstvennogo Universiteta imeni A. M. Gorkogo).

AVAILABLE: Library of Congress

VANGENG EYM, S. D.

AUTHOR: Vangengeym, S. D.

126-1-31/40

TITLE: On the influence of the temperature on the effect of intercrystallite internal adsorption in binary silver base alloys. (O vliyaniy temperatury na effekt mezhkristallitnoy vnutrenney adsorbtsii v dvoynykh splavakh na osnove serebra).

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol.5, No.1, pp. 174-176 (USSR).

ABSTRACT: As a result of earlier investigations (Ref.1) on specially selected binary systems with highly differing atomic radii of the components, using X-ray methods (Ref.2), a positive inter-crystallite internal adsorption of thallium, beryllium, zinc, bismuth and lead into silver was observed. For elucidating the factors which can influence the effect of inter-crystallite internal adsorption in the quantitative sense, the change of the degree of internal adsorption of horophilic admixtures in solid solutions as a function of the temperature was investigated. Such investigations can shed light on certain new aspects of the phenomenon of internal adsorption since the relation between the thickness of

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126-1-31/40

On the influence of the temperature on the effect of intercrystallite internal adsorption in binary silver base alloys.

the grain and the intercrystallite boundary changes with the temperature in the sense of changing the conditions of redistribution of the atoms of the horophilic component, the quantity of which remains constant for a given alloy. The following alloys were prepared: Ag with 1% Tl, Ag with 0.1% Be, Ag with 5% Zn, Ag with 0.3% Bi, Ag with 1% Pb. After forging and homogenisation, the ingots were cut into two equal specimens which were annealed simultaneously in iron containers filled with carbon powder. The annealing of a pair of specimens was effected at the temperatures: 900, 800, 700, 600, 700, 800, 900, 800 and 700°C, forging the specimens prior to each annealing. After each annealing one of the specimens was hardened, together with the container in water, whilst the other was cooled slowly in a furnace. The grain size after such heat treatment varied between 0.08 and 0.12 mm and this is too small to affect the changes in the lattice parameter. The results are graphed in Fig.1 showing the dependence of the lattice parameter of the binary silver base alloys on the hardening temperature

Card 2/3 (t, °C vs. a, Å). The results show that there is a

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On the influence of the temperature on the effect of intercrystallite internal adsorption in binary silver base alloys.

relation between the changes in the lattice parameters and intercrystallite internal adsorption. The lattice parameter of the alloy Ag-Tl decreases with increasing hardening temperature, i.e. the Tl concentration in the depth of the grain also decreases, consequently, the internal adsorption inside this alloy is intensified with increasing temperature. The intercrystallite internal adsorption in the alloys Ag-Tl, Ag-Be and Ag-Zn increases with increasing temperature (between 600 and 900°C) and decreases with increasing temperatures in the alloys Ag-Bi and Ag-Pb. The results are in qualitative agreement with the influence of factors determining the internal adsorption, considered in a previous paper, provided the concentration of the horophilic elements is taken into consideration. Acknowledgments are made to Professor V. I. Arkharov for his guidance.

There are 1 figure and 3 Slavic references.

SUBMITTED: January 17, 1957.

ASSOCIATION: Ural State University imeni A. M. Gorkiy.  
(Ural'skiy Gosudarstvennyy Universitet imeni A.M.Gor'kogo).

AVAILABLE: Library of Congress.

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VANGENGEYM, S. D. Cand Phys-Math Sci -- (diss) "X-ray study of the internal intercrystalline adsorption in silver-base alloys." Sverdlovsk, 1958. 7 pp  
(Min of Higher Education, USSR. Ural State Univ in A. M. Gor'kiy), 100 copies  
(KL, 11-58, 112)



VANGEYNGEYM, S. D.,

"X-ray Investigation of the Inter-Crystallite Internal Adsorption in Silver-base Alloys," Averdlovsk, 1958. (Dissertation presented and approved for the degree of Cand. Tech. Sci.) Ural State Univ. im A. M. Gor'kiy.

SOV/137-58-9-19790 D

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 9, p 239 (USSR)

AUTHOR: Vangengeym, S.D.

TITLE: X-ray Investigation of Intercrystalline Internal Adsorption in Silver-base alloys (Rentgenograficheskoye issledovaniye mezhkristallitnoy vnutrenney adsorbtsii v splavakh na osnove serebra)

ABSTRACT: Bibliographic entry on the author's dissertation for the degree of Candidate of Physical-Mathematical Sciences, presented to the Ural'skiy un-t (Urals University), Sverdlovsk, 1958

ASSOCIATION: Ural'skiy un-t (Urals University), Sverdlovsk

1. Silver alloys--Adsorption 2. Silver alloys--X-ray analysis

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SOV/126-7-3-30/44

AUTHORS: Arkharov, V. I., Vangengeym, S. D. and Klyuyeva, I. B.

TITLE: X-Ray Investigation<sup>1</sup> of Intercrystalline Internal Adsorption in Copper Base Alloys (Rentgenograficheskoye issledovaniye mezhkristallitnoy vnutrenney adsorbtsii v splavakh na osnove med1)

PERIODICAL: Fizika metallov i metallovedeniye, Vol 7, Nr 3, pp 457-458 (USSR)

ABSTRACT: Reversible changes in the lattice parameter<sup>18</sup> with change in grain size of polycrystalline solid solutions have been observed by Arkharov et alia (Refs.1, 2) in a series of binary and ternary alloys. These changes can be explained on the basis of an earlier hypothesis proposed by Arkharov (Ref.3) of the intercrystalline internal adsorption. In the present work the effect of reversible lattice parameter change has been observed in the alloy systems Cu-Ag<sup>17</sup> Cu-Mg<sup>1</sup> and Cu-Sn. The systems were chosen so that the addition elements should have a different valency. Alloys with horophile (positively active relative to internal adsorption) addition contents of the order of 1 - 2% were melted in a

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SOV/126-7-3-30/44

X-Ray Investigation of Intercrystalline Internal Adsorption in Copper Base Alloys

high frequency induction furnace. The ingots were homogenized, and after forging and supplementary annealing were cut into separate specimens. The latter were transformed by thermomechanical treatment, into either the fine-grained or coarse-grained state. In order to obtain a fine grain size (of the order of 0.05 mm) the specimens were thoroughly forged and annealed in a temperature range of 550 - 600°C; in order to ensure a coarse grain size they were reduced in a press by 5 - 10% and annealed at 800 - 900°C. After each annealing a layer, 1 mm thick, was removed from the specimens by means of concentrated nitric acid. The grain size was determined metallographically after etching in a solution of ammonium persulphate and ammonia. An X-ray investigation of the lattice parameter of the solid solutions was carried out by the Zaks method in a KR0S-1 camera, using Co-irradiation. The results of the X-ray investigation are compiled in the table on p 458.

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X-Ray Investigation of Intercrystalline Internal Adsorption in Copper  
Base Alloys

There is 1 table, and 3 Soviet references.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet imeni A. M. Gor'kogo  
(Ural State University imeni A. M. Gor'kiy)

SUBMITTED: October 16, 1958

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SOV/126-7-3-41/44

AUTHORS: Arkharov, V. I., Vangengeym, S. D. and Kliyuyeva, I. B.

TITLE: On the Causes of Brittleness<sup>18</sup> of Certain Copper Alloys<sup>21</sup>  
(K voprosu o prichinakh khrupkosti nekotorykh mednykh splavov)

PERIODICAL: Fizika metallov i metallovedeniye, Vol 7, Nr 3, pp 476-477  
(USSR)

ABSTRACT: Data exist of the fact that additions of Sb<sup>1</sup> (of the order of a few tenths of %) to Cu lead to a steep decrease in the impact resistance of the alloy (Refs.4 and 5). In this connection McLean (Ref.4) has established a hypothesis which coincides in its content with that pronounced earlier by Arkharov (Ref.1), and according to which the brittleness of copper containing antimony must be due to a "segregation without precipitation from the solid solution" of antimony atoms in the intercrystalline boundary region. In such a case, by bringing about preferential internal adsorption of Be in the intercrystalline zones, a complete (or nearly complete) displacement of Sb from these zones can be brought about, resulting in a rise of the impact resistance of an alloy with the same antimony content. The aim of

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# On the Causes of Brittleness of Certain Copper Alloys

the present work was to confirm this assumption. The following alloys were selected for study: (1) Cu + 1% Sb + 0.2% Be; (2) Cu + 1% Sb + 0.6% Be; (3) Cu + 1% Sb + 1% Be. The purity of the original copper was 99.99%. Ingots (melted under a borax layer in a graphite crucible) were forged into rods of square cross-section and given a homogenizing anneal (900°C, 35 hours). From these forgings specimens for impact testing were made (bars, 60 x 10 x 10 mm, with a hemispherical notch in the central line, 1 mm deep). From the remaining portion of the forgings specimens for X-ray investigation were made. X-ray investigation results have shown that preferential internal adsorption of Sb occurs in the first series of alloys; in the second and third series beryllium is preferentially internally adsorbed. Specimens for impact testing were annealed in an iron container which was covered with carbon, at 600°C for 20 hours. One half of the specimens of each series were quenched in water, the other half were slowly furnace cooled. The tests were carried out on a 30 kg pendulum impact machine. The second (reference) batch of specimens in contrast to the first were melted in evacuated and sealed quartz ampoules ( $10^{-4}$  -  $10^{-5}$  mm Hg). The dimensions of these specimens were 40 x 5 x 5 mm.

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On the Causes of Brittleness of Certain Copper Alloys

Their composition was chosen so as to decrease the concentration of beryllium to the greatest extent without changing the conditions for its preferential internal adsorption. In alloys containing Cu + 0.2% Sb + 0.2% Be, and those containing Cu + 0.5% Sb + 0.2% Be preferential internal adsorption of Be occurred; in alloys containing Cu + 1% Sb + 0.2% Be preferential internal adsorption of Sb occurred. The results of impact tests of specimens of the first and second batch have shown that the impact resistance in slowly cooled specimens did not change greatly with changing composition; in quenched specimens in the same cases, however, when antimony was preferentially adsorbed at the intercrystalline boundaries, the impact resistance was greatly lowered as compared with that of the specimens at which Beryllium was preferentially internally adsorbed. Thus it can be seen that the harmful influence of antimony on the impact resistance of copper can be diminished.

There are 6 references, of which 4 are Soviet and 2 English.

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On the Causes of Brittleness of Certain Copper Alloys

ASSOCIATION: Ural'skiy gosudarstvennyy universitet imeni A.M. Gor'kogo  
(Ural State University imeni A.M. Gor'kiy)

SUBMITTED: December 30, 1958

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67772

SOV/126-8-5-26/29

18.7510

AUTHORS: Arkharov, V.I., Borisov, B.S., Vangengeym, S.D., and Taluts, G.G.

TITLE: On the Question of the Mechanism of Intercrystalline Internal Adsorption in Dilute Solid Solutions

PERIODICAL: Fizika metallov i metallovedeniye, Vol 8, 1959, Nr 5, pp 792-794 (USSR)

ABSTRACT: The interaction between the electron shells of atoms in a dilute solid solution can strongly affect the behaviour of impurity atoms in this solid solution. This applies particularly to intercrystalline internal adsorption. By taking into consideration the electron interaction it is possible to describe the atomic mechanism of internal adsorption and associate it with quantitative data available in this field. If there are defects or structural non-uniformities in the lattice the impurity atoms react with them. This is a long-range order interaction and hence screening must become evident, i.e. the impurity atoms must behave as if they possessed a "screened" atomic radius. As any structural non-uniformity (among them grain boundaries) can be considered to be a dislocation system, for an

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On the Question of the Mechanism of Inter-crystalline Internal Adsorption in Dilute Solid Solutions

approximate description of the interaction between impurity atoms in a solid solution and lattice distortions, it is possible to use Webb's calculation (Ref 11). In this way one can evaluate the number of atoms,  $N_0$ , diffusing through the grain body to the dislocation system modelling the inter-crystalline boundary, i.e. the number of atoms experiencing inter-crystalline internal adsorption. Such a calculation was carried out by the authors for the solid solutions Ag-Tl, Ag-Zn, Ag-Pb, Cu-Mg and Cu-Sn. The concentrations of horophilic elements in these alloys were considerably lower than their volume solubility. The results of the calculations are reported in the table on p 793. Although the calculated and experimental results agree quite well, a discrepancy can be observed which in a few cases exceeds the absolute errors in lattice parameter measurements. Among the possible reasons for this discrepancy the following can be quoted. First, Webb's formula, which contains macroscopic factors, is somewhat artificial for the description of phenomena of an atomic

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On the Question of the Mechanism of Intercrystalline Internal  
Adsorption in Dilute Solid Solutions

scale, and can be justified only as a first approximation. Secondly the influence of the relative orientations of neighbouring grains which can change the width of the intercrystalline zone, and the associated lattice parameter (this change varying from one grain group to another) is not taken into consideration. Thirdly the block structure which can change from one test to another can, as a result of internal adsorption at block boundaries, change the magnitude of the lattice parameter somewhat. These facts are subjects for further investigation.

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There are 1 table and 11 references, of which 4 are Soviet, 6 English and 1 German.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet: Institut  
fiziki metallov AN SSSR  
(Ural'sk State University: Institute of Physics of  
Metals, Acad.Sci. USSR)

SUBMITTED: June 19, 1959

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18.8100

S/126/60/009/01/015/031  
E111/E191

AUTHORS: Arkharov, V.I., Borisov, B.S., Vangengeym, S.D., and Sokolova, G.K.

TITLE: Investigation of the Connection between Internal Adsorption in Alloys and their Electrical Resistance

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 1, pp 81-85 (USSR)

ABSTRACT: The authors discuss methods which have been used for the experimental study of internal adsorption, noting the general difficulties of such investigations. Their own previous work (Refs 1-3) in which changes in lattice parameters associated with adsorption effects in many binary and ternary alloys were studied, was followed by an attempt to provide a qualitative explanation (Ref 4). Further work has shown that neither the thermodynamic nor a qualitative molecular-kinetic approach is sufficient to elucidate the mechanism of inter-crystallite internal adsorption. The authors show that internal adsorption, being related to the ionic sub-lattice of the crystal, must be closely connected with electronic processes in the dilute solid-solution lattice. They go on to

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E111/E191

# Investigation of the Connection between Internal Adsorption in Alloys and their Electrical Resistance

consider the electrical resistance of dilute solid-  
solutions and then to describe experiments aimed at  
checking the model ideas by resistance determinations on  
such solutions relative to the grain size of polycrystalline specimens. The alloys studied were  
Cu - 1% Cd, Cu - 1% In, Cu - 0.6% Sn, and Cu - 1% Sb,  
made from electrolytic copper (99.99% Cu) and granulated  
(99.9%) other elements. Alloys were melted in quartz  
crucibles under borax and after forging and  
homogenizing annealing were cut longitudinally, each half  
being drawn into a wire 410 mm long and 0.3 mm in  
diameter. Resistance was determined at temperatures from  
-192 to +25 °C directly after drawing (curves 1 in a  
figure on p 84, showing resistance as a function of  
temperature) and after low-temperature (400-600 °C)  
tempering (curves 2) and high-temperature (800-900 °C)  
tempering followed by slow cooling (curves 3).  
Resistance for all alloys increased with temperature,  
decreased somewhat at any given temperature on low-

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Investigation of the Connection between Internal Adsorption in Alloys and their Electrical Resistance

temperature tempering and increased again on high-temperature tempering, due to desorption of the additive atoms from the zones of internal intercrystallite adsorption. The change in resistance due to desorption has a value depending on the difference,  $z$ , of the valences of the components: when the  $z$  values are even (Cu - In, Cu - Sb) the effect is considerably less than in alloys where it is odd (Cu - Cd, Cu - Sn). This is in full agreement with Friedel's (Ref 6) ideas on electron screening in solid solution, where screening is less for even values of  $z$  and there is therefore less difference between the state of the additive atom in a grain and at an inter-crystallite boundary: hence diffusional processes (internal adsorption and desorption) are less pronounced.

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There are 1 figure and 14 references, of which 6 are Soviet, 5 English, 1 German, 1 Japanese and 1 in Acta Metallurgica (probably in English).

06483

S/126/60/009/01/015/031  
E111/E191

Investigation of the Connection between Internal Adsorption in  
Alloys and their Electrical Resistance

ASSOCIATION: Ural'skiy gosudarstvennyy universitet imeni  
A.M. Gor'kogo  
(Ural'sk State University imeni A.M. Gor'kiy)

SUBMITTED: October 9, 1959

Card 4/4



ARKHAROV, V.I.; BORISOV, B.S.; VANGENGELM, S.D.

Revealing the characteristics of crystallite interlinking in an  
X-ray scattering image. Fiz. met. i metalloved. 10 no.3:367-374  
S '60. (MIRA 13:10)

1. Institut fiziki metallov AN SSSR i Ural'skiy gosudarstvennyy  
universitet im. A.M.Gor'kogo. (X rays--Scattering)  
(Crystal lattices)

21218

S/126/61/011/003/005/017  
E193/E483

18.9200 1145, 1148, 1555

AUTHORS: Arkharov, V.I., Borisov, B.S. and Vangengeym, S.D.  
TITLE: Manifestation of the Process of Internal Intergranular  
Adsorption in the X-Ray Scattering Pattern  
PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.11, No.3,  
pp.388-391

TEXT: It was shown earlier by the present authors (Ref.8) that the phon intensity of X-ray diffraction patterns, obtained on massive polycrystalline specimens, is higher than that of patterns produced by powder specimens of the same material with grains of the same size. This effect, attributed to the presence of an amorphous layer in the polycrystalline specimens, was much less pronounced in pure materials which indicated preferential adsorption of the impurity atoms in the grain boundary regions. The data, then obtained, were insufficient to form any conclusive opinion regarding the behaviour of impurities in the region of intercrystalline internal adsorption and to determine whether these impurities are present in the solid solution or in the second phase; hence, the investigation described in the present paper. As before, the experiments were carried out on Card 1/4

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## Manifestation of the Process ...

both massive and powder specimens, characterized by the same grain size. The experimental materials consisted of electrolytic copper (99.94% purity) and a Cu-base alloy containing 0.35 wt.% antimony. The results of the measurements of the intensity of X-ray scattering are reproduced graphically. In Fig.1, the intensity of the scattered X-ray beam ( $I$ , pulses/min) is plotted against the diffraction angle  $2\theta$  for (a) plastically deformed specimens, (b) specimens annealed for 2 h at 400°C and (B) specimens annealed for 6 h at 800°C, the continuous and broken curves relating respectively to massive and powder Cu specimens. The results obtained for the Cu-Sb specimens are presented in the same manner in Fig.2, except that graphs (b) and (B) relate respectively to specimens annealed for 2 h at 450°C and for 6 h at 970°C. It will be seen that whereas the  $I(2\theta)$  curves for the massive polycrystalline specimens of both Cu and Cu-Sb alloy showed intensity peaks (shifted for the (111) lines of Cu towards the smaller values of  $2\theta$ ), no intensity peaks were observed on curves constructed for the powder specimens. Since no peaks were observed on the  $I(2\theta)$  curves for massive specimens of high (99.999%) purity copper, it was concluded that these peaks are associated with the

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Manifestation of the Process ...

formation of a small quantity of a new phase, precipitated in the region of intercrystalline internal adsorption from the locally supersaturated solid solution. In the case of electrolytic copper in which tin was the main impurity, the appearance of the X-ray scattering intensity peak was caused by the formation of the  $\text{Cu}_3\text{Sn}$  phase; the peak on curves, constructed for the Cu-Sb alloy, was due to the precipitation of the  $\text{Cu}_3\text{Sb}$  phase. There are 2 figures and 9 references: 7 Soviet and 2 non-Soviet.

ASSOCIATIONS: Institut fiziki metallov AN SSSR  
(Institute of Physics of Metals AS USSR)  
Ural'skiy gosudarstvennyy universitet im. A.M.Gor'kogo  
(Ural State University imeni A.M.Gor'kiy)

SUBMITTED: October 3, 1960

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Manifestation of the Process ...

Fig.1.

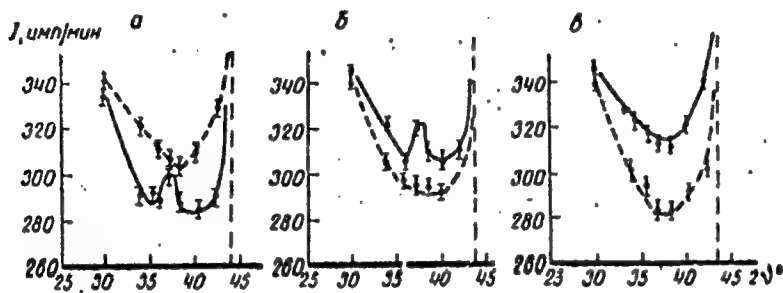
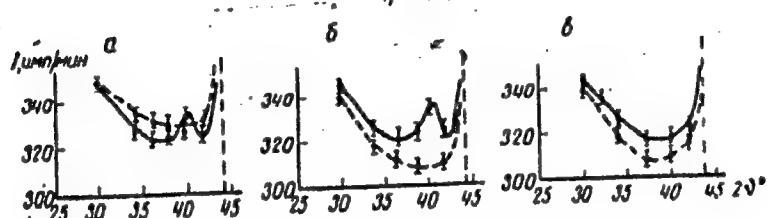


Fig.2.



Card 4/4

Please insert Fig 1 from 15399 and Fig 2 from 15400

ARKHAROV, V.I.; VANGENGEYK, S.D.

Effect of internal adsorption on the results of precision  
measurements of polycrystal lattice constants. Zav.lab. 27  
no.6:683-686 '61. (MIRA 14:6)

1. Institut fiziki metallov AN SSSR i Ural'skiy gosudarstvennyy  
universitet imeni A.M. Ger'shego. (Crystal lattices)  
(Adsorption)

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decreases; increase in

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LIKACS, Gyula; TUSNADI, Gyozo; VANGER, Eva

Growth of meat production in fish hatcheries with regard to the number of fishes and their initial weight. Allattani kozl 51 no.1/4:71-76 '64.

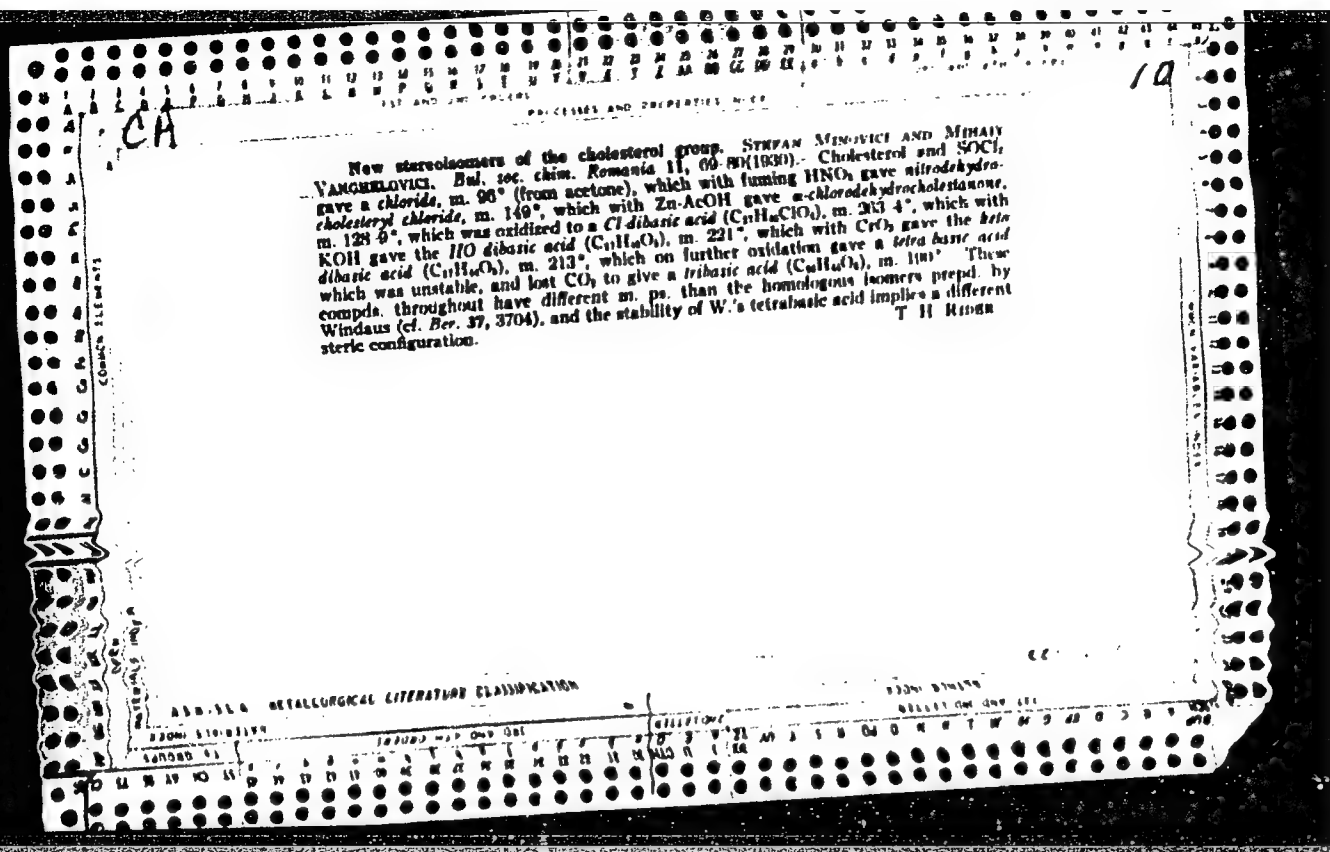
1. Chair of Zoology, College of Agriculture, Keszthely.

1. VANGOR, V. V.
2. USSR (600)
4. Differential Equations, Partial
7. Theory of a field of local conical surfaces in  $X_3$  and its application to the calculus of variations and the theory of partial differential equations, Trudy Sem. po vekt. i tenz. anal. No. 6, 1948.

9. Monthly List of Russian Accessions, Library of Congress, June 1953, Unclassified.

11. New cases of stereoisomerism in the nitro-  
ester group: S. Mikovics and M. Vághvári  
(Bud. Chem. Club, Budapest, 1933; Z. 66-67) and  
the author of this work: Wiesner and Sells (At.  
1904, 1, 1910) and the present authors in the pro-  
duction of stereoisomerism in the chloroethyl group  
due to the different planes of the adjacent groups  
and cyclohexane rings in Wiesner's formula.  
An analogous series of operations to that described  
by Wiesner in the case of  $\beta$ -chloro- $\gamma$ -butyrolactone, m. p.  
180°, has been carried out with the  $\alpha$ -chloro- $\gamma$ -butyrolactone  
of Marthner and Sells and yields isomeric  
products up to the final stage (A., 1904, 1, 48), m. p.  
158°. With fuming nitric acid in acetic acid solution,  
 $\alpha$ -chloro- $\gamma$ -butyrolactone gives a dibasic acid,  
$$\text{OO}_2\text{H}-\text{C}_4\text{H}_7-\begin{matrix} \text{CH}(\text{OO}_2\text{H}) \\ \text{CH} \end{matrix}-\text{CHCl}_2$$
 m. p. 132-134°, the  
cyclopentane ring being ruptured. A more soluble  
substance, of m. p. about 100° and of unknown comp.

acetone, is also produced. Potassium hydroxide converts this chloro-acid into the hydroxy-acid, m. p. 211°, and this with phosphorus trioxide in acetic acid yields the keto-acid, m. p. 215°, more prolonged action of the oxidizing agent yielding a trihalo acid,  $(CO_2H)_3C_6H_3Cl_3$ , m. p. 190°, by rupture of the cyclohexanone ring in the keto-acid and loss of carbon dioxide. On the theory put forward in this and earlier papers as to the structure of  $\alpha$ -chloro-cyclohexanone, the final product should have been the tetracarboxylic acid of Winkler (*loc. cit.*). The reason for this discrepancy has not yet been satisfactorily explained. H. A. PRIGG.



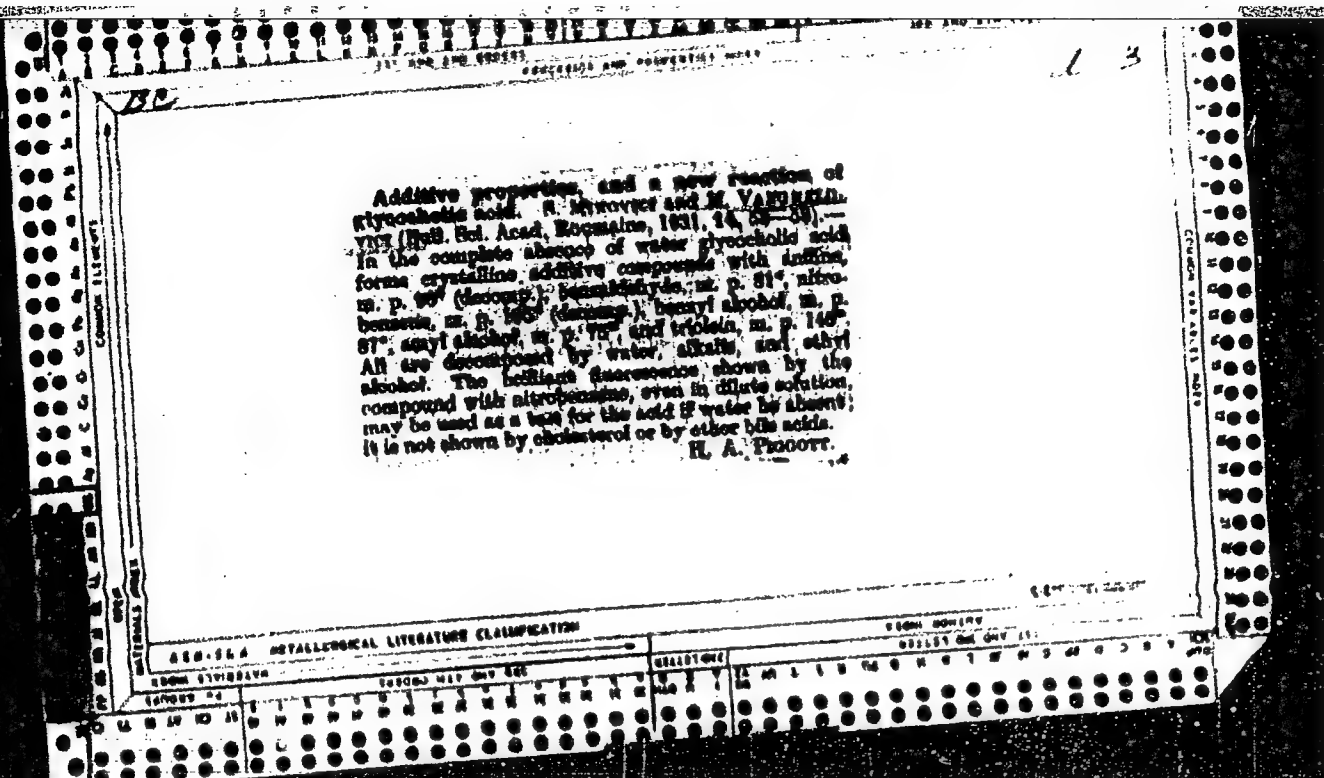
The addition power of cholic acid. STEFAN MINOVICI AND MIHAIL VAMGH-  
LOVICI. *Bul. soc. chim. Romania* 12, 5-13 (1930).—Cholic acid possesses the ability  
to form addn. compds. with certain org. substances, which addn. power is inferior  
to that of desoxycholic acid. M. and V. prepd. with quant. yields addn. compds.  
of cholic acid with nitrobenzene ( $(C_6H_5O_2) \cdot PbNO_2$ ), aniline, amyl alc., benzaldehyde,  
m-toluidine, benryl alc., cholic acid triolein, and they also tried to prep. an addn. compd.  
of cholic acid with oleic acid, but failed to isolate this addn. compd. in pure form, while  
all the other compds. were isolated in pure form. All these compds., in contrast to the  
addn. compds. of desoxycholic acid, which are very stable, are very labile, are decompd.  
by water, alc. and NaOH, but they were obtained by washing out the excess of the org.  
compds. with a neutral solvent such as  $CCl_4$ , toluene, ligroin, etc. The soly. of these  
addn. compds. is greater than the free cholic acid, they usually are prismatic crystals,  
colorless and odorless. Exposed to air for only 12 hrs., decompn. will occur and, there-  
fore, they must be kept *in vacuo*.  
F. R. GREENBAUM

F. R. GREENBAUM

Q-3

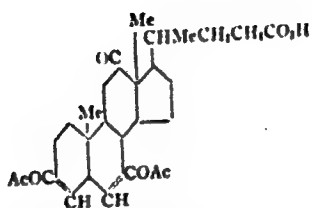
**Additive groups of the isomeric R. Marinova and M. Vassileva** (Bul. Soc. Chim. Ekman, 1939, 42, 4-15).—By heating olefin acids (A) with the following reactive oxygen compounds (B) with rapid evolution of sulphur, cooling, and washing the separated crystals with ethanol and light petroleum, the following unstable additive isopropenoids of the type  $\text{A}_2\text{B}$  are obtained: nitrobenzene, m. p. 159-160°; aniline, m. p. 562°; acrylonitrile, m. p. 180-182°; benzaldehyde, m. p. 187°; *m*-toluidine, m. p. 130°; benzyl alcohol, m. p. 128°; glyceryl trinitrate, m. p. 142°; add. oleic acid, m. p. 120°, the last named

being very unstable and not obtained in the pure state. These things usually unifies those obtained with decarboxylic acid (Wittell and Setze, A. 1916, t. 710): are unstable in air and are decomposed by water, alcohol, and dilute sodium hydroxide. It is suggested that the formation of oleic acid in the bile to form similar compounds with bile acid, nutrient materials usually insoluble in water, thus rendering them soluble in the medium for absorption in the blood stream, where, in a medium of different  $p_{\text{H}}$  value, they are decomposed, the liberated oleic acid being returned to the bile through the liver. J. W. BAKER.





Bile acids. III. Enolization of dehydrocholic acid and some experiments concerning the structure of this acid. St. Minovici and M. Vanghelovici. *Bul. soc. chim. România* 14, 171-8(1932); cf. C. A. 25, 4236. The purpose of the present expl. work was to investigate the presence of an aldehyde group in dehydrocholic acid and with the behavior of this acid upon treatment with anhyd. NaOAc and Ac<sub>2</sub>O and with HCl, in an attempt to establish the relation of the acid with cholesterol. The acid was prepd. according to Hammarsten (*Ber.* 44, 71), by treatment of pure cholic acid in glacial AcOH with CrO<sub>3</sub> in H<sub>2</sub>O and treatment of the reaction product with H<sub>2</sub> and the acid in sharply 20°. Treatment of 1 g. of dehydrocholic acid with 3.2 g. of malonic ester, addn. of a few drops of piperidine to the soln., standing for 4 days and subsequent addn. of MeOH, shaking with H<sub>2</sub>O and treatment of the aq. layer with dil. HCl, gave upon recrystn. of the ppt. from dil. HCl, dehydrocholic acid, in 25%. The dehydrocholic acid had therefore not entered into the reaction, and possesses exclusively 3 ketonic groups. Treatment with NaOAc and Ac<sub>2</sub>O after the method of Mannich (*Ber.* 39, 1564) with cyclohexanone and its Me deriv., gave rise to a diacetylated enol deriv. of the acid, yielding dehydrocholic acid upon hydrolysis with KOH. The perfectly dried product boiled with MeOH, upon addn. of a few drops of concd. H<sub>2</sub>SO<sub>4</sub>, gives the 3 $\beta$ -dehydrocholate, m. 242°. The expls. proved that on hydrolysis the Ac groups are (1) -- according to the following scheme:  $\text{--CH}_2\text{C(=O)Ac} + \text{HCl} \rightarrow \text{C(H)=C(H)--} + \text{AcOH}$ , and assign to the  $\beta$ -enol deriv. of dehydrocholic acid, the probable formula:



In the case of the reaction with  $\text{BaCl}_2$ , the results were less conclusive; the microcryst. powder isolated by repeated extrns. with warm, dil. alc., m.  $115^\circ$  and showed anal. properties approaching those of the dibenzoylated enol deriv. Thus the nuclei of dehydrocholeic acid behave exactly like other hydroaromatic nuclei. Consequently cholesterol, which can be converted to derivs. of cholic acid, contains such rings of a terpenic nature.

Margaret Jurro

A-3

**Bit acids. III. Examination of dehydrocholic acid and experiments on the structure of the acid.** S. KIROVSKI and M. VANDERLOOY (Bel. Soc. Chim. Bruxelles, 1962, 14, 171-175).—Dehydrocholic acid does not condense with  $\text{CH}_3\text{CO}_2\text{Et}$ , showing the absence of the CHO group, but gives  $\text{Ac}$ , m.p. 201°, and  $\text{Et}$  derivatives, m.p. 115°, of the di-enol form of the acid. F. R. S.

ASH-514 METALLURGICAL LITERATURE CLASSIFICATION

SEARCHED	INDEXED	SERIALIZED	FILED
NO	NO	NO	NO

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Structure of the second nucleus of cholesterol. St. Minovici and M. Vanghelovici. *Bul. soc. chim. Romania* 15, 39-44(1933).--Starting with cholesterol the authors had previously prepd. a Cl dibasic acid (I) m. 264° (cf. C. A. 24, 2487). I, when treated with  $Ac_2O$  and diluted., yields an anhydride (II) m. 100°. When II is dissolved in NaOH and HCl added a ppt. is obtained, which, recrystd. from AcOH, m. 264°. Mixed m. ps. indicate it to be identical with I. The formation of the anhydride and not the ketone indicates that the carboxyl groups of I are on adjacent C atoms, but the ring may be either 6- or 8-membered. Accepting a hydrochrysmine structure to be present in cholesterol and from analogy between I and diphenic acid, the authors conclude that the 2nd ring of the compd. is 6-membered. W. A. M.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

11f

Ca

Origin, metabolism and elimination of cholesterol in the animal organism. S. Minovici, M. Vanghelovici and G. Marza. *Bul. soc. chim. Romania* 18, 137-52 (1937). -Dogs placed on a boiled-potato diet lost wt. and showed a rapid loss in blood cholesterol. The addn. of egg white caused a sharp rise in cholesterol the first 2 days but then dropped back to normal. Oleic acid added to the diet caused a marked increase in cholesterol formation. Casein and egg yolk both showed a marked increase also but it is known that egg yolk contains cholesterol. In order to demonstrate that this increase was due to oleic acid, the total cholesterol content was detd. For this purpose the two insects, the yellow *Blatta germanica* and the black *Stylogygus orientalis*, were used. Changes in cholesterol were observed if the diet contained either glucose, starch, casein and starch and margarine acid and starch. Stearic acid and starch showed no loss or gain. If the diet contained oleic acid there was a marked increase in cholesterol. Black field mice and white lab. rats gave analogous results. Starved rats fed oleic acid showed a marked increase in cholesterol, while stearic acid produced no change. Oleic acid injected into the blood stream below the liver showed a greater amt. of cholesterol in the blood leaving the liver than there was in the portal vein. Hence the liver is capable of synthesizing cholesterol from oleic acid and this can be converted to cholic acid. Julius White

ASS-5LA METALLURGICAL LITERATURE CLASSIFICATION

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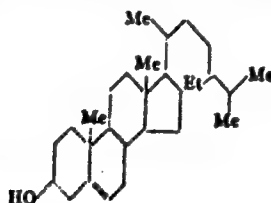
SECTION 100

11A

Recent work on the sexual hormones. Mihail Vang-  
bélavici. Bul. soc. chim. Roménie 168, 33-51(1934)  
E. H.

ASAC-SLA DETAILING LITERATURE CLASSIFICATION

Structure of sitosterol. Mihail Vanghelovici and Barbu N. Angelescu. *Bol. soc. Chim. Romania* 17, 177-90 (1935).—Cholesterol, heated gently for 2 hrs. with an excess of citraconic anhydride, gives cholesterol citraconate (I), m. 195°. Sitosterol, similarly treated, gives sitosterol citraconate (II), m. 160°. The following derivs. of chloro-6-cholestanone (III) are prepd.: oxime, m. 178°; semicarbazone, m. 155°; nitrophenylhydrazones, m. 207°. Nitration of sitosterol chloride with concd. HNO<sub>3</sub> and NaNO<sub>2</sub> at room temp. gives nitrodehydrocholesterol chloride (IV), m. 118°. Reduction of IV with Zn and AcOH gives chloro-6-sitostanone (V), m. 112°; oxime, m. 180°; semicarbazone, m. 207°; nitrophenylhydrazones, m. 168°. Reduction of III with Na + Hg in alc. gives iso-6-cholestanone (VI), m. 97°; oxime, 157°. V reduced in the same manner gives 6-sitostanone, m. 77°; oxime, m. 173°. Oxidation of V with HNO<sub>3</sub> in AcOH gives a chloro dibasic acid (VII), C<sub>27</sub>H<sub>44</sub>ClO<sub>4</sub>, m. 277°. VII, heated with Ac<sub>2</sub>O, gives the anhydride. Sitosterol acetate oxidized with CrO<sub>3</sub> in AcOH gives Me<sub>2</sub>CO, indicating that the lateral chain in sitosterol is possibly MeCHCH<sub>2</sub>CH<sub>2</sub>CH(Et)CHMe<sub>2</sub>. Reduction of III and V by Clemmensen's method yields isocholesterol, m. 110°, and isositosterol chloride, m. 108°, resp. In view of existing facts the following is suggested as the probable formula of sitosterol:



W. I. Peterson

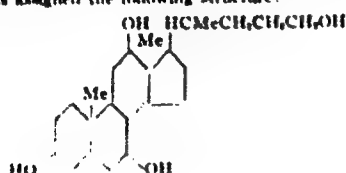
1ST AND 2ND COLUMNS										3RD AND 4TH COLUMNS									
PROCEDURES AND PROPERTIES INDEX																			
<div style="display: flex; justify-content: space-between;"> <span>BC</span> <span>A-4</span> </div> <p>Origin of cholesterol in the animal organism.  M. VANDERHOEF and F. PARNON (Bul. Soc. Chim.  Roubaix, 1936, 48, 107-115).--Perfusion <i>in vivo</i>  of the liver, kidney, and spleen of dogs with squalene  or, to a smaller extent, oleic acid, but not with  squalene hexachloride, increases the cholesterol  content. Sterols are formed in animal organisms from  long-chain, preferably unsaturated, compounds.  R. S. C.</p>																			
ASS-5LA METALLURGICAL LITERATURE CLASSIFICATION																			
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CA

The reduction of cholic acid by the Bouveault method (Aiball Vanghebovi) *Rus. Nov. Khim. Raznos. 18A, 181 (1938)*. Since the saponins, the cardiac poisons and cholic acid (1) are all closely related derivs. of the

fundamental sterol unit, cyclopentanophenanthrene, all having specific actions on the heart, V. prepd. the carbinol deriv. of 1 by reduction of its corresponding ester, m. 162°, and found it possessed a tonic effect as detd. from cardiograms of its action on the frog heart *in vitro*. An excess of the soln. of the carbinol deriv. diminishes the amplitude of the heart beat although it is less effective than digitalis ext. Reptl. observation indicates that the animal organism is capable of synthesizing similar compds. having a regulator effect on the heart. The carbinol deriv., m. 227°, is assigned the following structure:



Attempts to cyclize the side chain by diverse methods and thereby to prep. a cryst. compd. were unsuccessful. Deoxycholic acid reduced in a similar manner yields a compd. m. 150° while cholanic acid yields a substance m. 105° and which is very difficult to purify. The carbinol deriv. of cholic acid was prepd. as follows: 1 g. of the Et ester of 1 prepd. by the method of Curtius is dissolved by warming with 40 cc. abs. anhyd. EtOH in a flask fitted with a condenser and a CaCl<sub>2</sub> tube. Four g. Na is added and the liquid heated almost at its b.p. for 3 hrs. After 2 hrs. heating H<sub>2</sub>O is added and the upper part of the reaction mixt. becomes liquid. The liquid is decanted off, care being taken to retain the black residue in the flask. The alk. soln. is further dild. with H<sub>2</sub>O and extd. with Et<sub>2</sub>O several times. Evapn. of the solvent yields a resinous mass which, when recrystd. from EtOH, yields the carbinol C<sub>26</sub>H<sub>46</sub>O<sub>2</sub>, m. 227°. The wt. of crude product is 20-30 mg. Acetylation yields a resinous product which cannot be crystd.

W. A. Cook

10

Introduction of nitrogen in the steroid molecule. II. Partial synthesis of norcholestanamine. Mihail Vangelov, *Bul. Soc. Chim. Roumanie* 19A, 35 42 (1967), cf. C. A. 36, 7110<sup>u</sup>.—The partial synthesis of norcholestanamine was started with cholic acid, m. 190°. The acid was transformed into dehydrocholic acid by Hammersten's method. The latter was reduced according to Clemmensen, giving cholanolic acid which was made into the Et ester and transformed into the hydrazide. This was then submitted to the Curtius degradation, first into the azide then to urethan and the latter by hydrolysis yielded the corresponding amine m. 93° having 1 C less than cholic acid. The amine was characterized as the Ac deriv., m. 171°, and a HCl salt, m. 285°. Norcholestanamine is tasteless and insol. in H<sub>2</sub>O. Benjamin Prescott

1ST AND 2ND COLUMNS																										3RD AND 4TH COLUMNS																									
PROCESSING AND PRESENTATION																																																			
<p>Relations between constitution of organic compounds and their action on the organism. Mihail Vanghelovici. Hid. ser. chim. Romania 19B, 12 (1937). A lecture. C. I. B.</p>																																																			
<p>ASAC-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																																																			

BC

7-3

Introduction of nitrogen into sterols. III.  
Preparation of deoxycholamine. M. VANGHE-  
LOVETI (Bul. Soc. Chim. România, 1938, 20, 231—  
235; cf. A., 1938, II, 405).—Deoxychohydrazide  
(modified prep. from the acid by way of the Et ester)  
gives the azide, decomp.  $\sim 67^\circ$ , and thence the  
urethane, m.p.  $110^\circ$ , which, when distilled with CaO  
at 4 mm, gives deoxycholamine, m.p.  $118^\circ$  [hydro-  
chloride, m.p.  $247^\circ$  (decomp.); platinichloride, de-  
comp.  $194^\circ$ ].  
R. S. C.

554-SLA METALLURGICAL LITERATURE CLASSIFICATION

NAME AND ADDRESS		PROCESSED AND PROPERTY INDEX		NO. AND DATE RECEIVED	
<p><b>Synthetic cholesterol.</b> N. VARGAS-CORRAL and B. N. ANGELEROV (Bull. Soc. Chim. Mexique, 1953, 57, 177-180). When treated with chromic acid yields the cholesterol (I) and cholesterol (II) (following formula suggested), afford, respectively, acetate, CH<sub>3</sub>(CH<sub>2</sub>)<sub>17</sub>CHOH.              m.p. 105° (Br-derivative, m.p. 163°, and steroyl, m.p. 128°; semicarbazone, m.p. 207°). The following reactions, similar in both series, show the identity of the steroids in top II as (II) and (III). With conc. HNO<sub>3</sub>, steroyl valerate affords allylcholesterolide chloride, m.p. 118°; reduced (Ba-OH) to sterol, m.p. 163°; reduced by Na-Hg to boiling hydrocarbon, m.g. 163°; reduced by Na-Hg to boiling hydrocarbon, m.g. 163°; reduced by Na-Hg to boiling hydrocarbon, m.g. 163°. Oxidation of (III) with fuming HNO<sub>3</sub>-AcOH affords a dibasic acid, C<sub>27</sub>H<sub>46</sub>O<sub>4</sub>, m.p. 277°. Reduction (Lithium) of (III) affords a chloroacetate, m.g.</p>		<p>108°. Reduction of cholesterol-3-one (m.p. 175°; semicarbazone, m.p. 163°; p-nitrobenzylhydrazone, m.p. 207°) with Na-Hg-EtOH affords cholesterol-3-one, m.p. 99° (semicarbazone, m.p. 155°), probably identical with the known derivative, m.p. 99° (Winkler &amp; Cole, J. Biol. Chem., 1932, 98, 107). Semicarbazone reduction gives allylcholesterolide chloride, m.p. 118°. The presence of the suggested side chain in (II) is indicated by the production (in small yields) of (XII), and a solid ketone (menthol odour), which is one methylheptanone, by oxidation of steroyl acetate with CrO<sub>3</sub>-AcOH.</p>		<p>J. W. R.</p>	
FROM OVERSEAS		FROM DOMESTIC		RECEIVED ONE DAY LATER	
CLASSIFIED BY		CLASSIFIED BY		CLASSIFIED BY	
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FILED BY		FILED BY		FILED BY	

**Introduction of nitrogen into steroid molecules.**  
 M. V. VANDERSTRAETEN and G. VAN DER VLIET (Bel. Soc. Chim. Roum. 1955, 17, 249-255). 3-Chloro-4-oxo-cholestane, m.p. 178°, and Na-EtOH give 4-amino-cholestane, m.p. 126° (hydrochloride, decamp. 270°; Ac derivative, m.p. 181°). 3-Bromocholestane (prop. by PBr<sub>5</sub>-C<sub>6</sub>H<sub>5</sub>, m.p. 78°, and HNO<sub>3</sub>-NaNO<sub>2</sub> give a poor yield of the 6-NO<sub>2</sub>-derivative, m.p. 150°. 3-Bromocholestane (I) gives similarly the 6-NO<sub>2</sub>-derivative, m.p. 154°, reduced by Zn dust-HCl in cholestan-6-one, m.p. 89° (oxime, m.p. 197°), probably identical with, but possibly a stereoisomer of, Windaus' ketone, m.p. 89° (A., 1920, 1, 434). The reactivity of the halogen in steroid derivatives is greatly influenced by other groups present. Thus, 3-chlorocholestane is stable to hot Na-Hg, 3-chlorocholestan-6-one loses its Cl to this reagent, whilst the Cl of the acid (II) is removed by hot aq. NaOH. (I), 3-chlorocholestane at 170°, or its dibromide with NHPhNH<sub>2</sub>, give N-phenyl-N-3-cholesterylhydrazine, m.p. 196° (Ac derivative, m.p. 188°; picrate, m.p. 182°), the structure of which is proved by formation of benzyl.



ideae, m.p. 150°, allylidenes, m.p. 137°, cinnamylidenes, m.p. 156°, p-hydroxybenzylidenes, m.p. 158°, phenylmethylmethylenes, m.p. 159°.

propylidenes, m.p. 83°, and p-nitrobenzylidenes, m.p. 163°, derivatives, a hydrazine with Et<sub>2</sub>amine, m.p. 127°, and a tetrazine, m.p. 163°. N-p-Tolyl-N-3-cholesterylhydrazine, m.p. 163°, and N-phenyl-N-3-cholesterylhydrazine, m.p. 163° (Ac, m.p. 110°, benzylidene, m.p. 108°, and phenylmethylmethylenes, m.p. 185°, derivatives; tetrazine, m.p. 132°), are similarly prepared. (I) and the appropriate base give 3-anilino, m.p. 177°, n-butylidene, m.p. 170°, and n-anilidinocholestan, m.p. 134°. Ergosterol and 24,25-C<sub>25</sub> give a cholestanene, m.p. 102° (hydrochloride, m.p. 108°), probably stereoisomeric with the known compound, m.p. 105°.

R. S. C.

1ST AND 2ND SECTORS										3RD AND 4TH SECTORS									
PROCEDURES AND PROPERTIES INDEX																			
BC										<p>Introduction of nitrogen into the sterol molecule. II. Partial synthesis of norcholanylamine.</p> <p>M. VAKENKOVICI (Bul. Soc. Chim. Roumanie, 1937, 19, 35-42; cf. A., 1938, 982).—Et cholanate and <math>N_2H_4 \cdot H_2O</math> in EtOH yield cholanhydrazide (+ EtOH), m.p. 165° (Ac derivative, m.p. 235°), converted by AcOH-HNO<sub>3</sub> into the azide, m.p. 98-99° (decomp.), and thence (EtOH) into the weak base, m.p. 135°, which when distilled with CaO at 9 mm. gives norcholanylamine, m.p. 95° (Ac derivative, m.p. 177°; hydrochloride, decomp. 285°). J. D. R.</p>									
ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION										FROM SOURCE									
FROM SYNDICATE										FROM SOURCE									
SYNDICATE										SYNDICATE									

137 AND 138 CROSS  
PROCESSING AND PROPERTY INDEX  
140 AND 141 CROSS

BC

Introduction of nitrogen into the steroid molecule. IV. Condensation of bile acid hydrazides with carbonyl compounds. M. VAPKELOVSKI (Bul. Soc. Chim. Roumanie, 1938, 20, 237-241).--Cholhydrazide and RCHO in dil. HCl give the  $CHPh$ , m.p. 148°;  $p-OMe-C_6H_4-CH$ , m.p. 140°, allylidene, m.p. 160°;  $CHPhCH_2-CH$ , m.p. 150°; furfurylidene, m.p. 145°;  $CH_2$ , m.p. 210°; and  $OO_2H-CH-CMe$ , m.p. 210° (could not be purified), derivatives. Deoxycholhydrazide gives the  $CH_2$ , m.p. 214° (decomp.), furfurylidene, m.p. 138°,  $p-OMe-C_6H_4-CH$ , m.p. 167°, and  $CHPh$  derivative, m.p. 75°. Cholanhydrazide gives  $CH_2$ , m.p. 130°, and  $CHPh$  derivatives, m.p. 146°. Other alkylidene derivatives could not be obtained. R. S. C.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

FROM SYMBOL

SECONDARY MAP ONLY ONE

ILLUSTRATION

FROM SYMBOL

ILLUSTRATION ONLY ONE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



BC

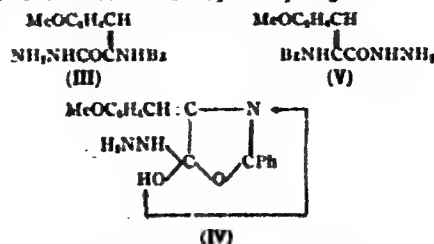
Biosynthesis of sterols by *Aspergillus niger*.  
M. VANONZORINI and F. SERRAN (Bull. Acad. Sci.  
Roumaine, 1939-40, 22, 287-292).—The fact that *A.*  
*niger* grows well in pure org. media containing  
substances with less than 6 C (e.g., glycerol) shows that  
sterols are synthesized from small C chains in accordance  
with the results obtained by Rittenberg with *D.*  
Addition of SO<sub>2</sub> inhibits the formation of sterols in  
*A. niger*, thus demonstrating that during synthesis of  
sterols in the cell an active hepton-CHO group appears.  
The sterols obtained by decomp. the digitonin complex  
obtained from *A. niger* grown on glycerol as  
sole source of C include ergosterol and other non-  
identified sterols.

a-4

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

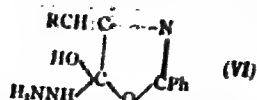
**Oxazolones series. I. Preparation of isomeric hydrazides.** Mihail Vanghelovici and Ilieana Meloe. *Sec. Chim. Romania. Sect. Sci. române Stiinta, Bul. Chim. part. apl.* (2) 3A, 85-106 (1941-1943).  $p$ -MeOC<sub>6</sub>H<sub>4</sub>CHO, hippuric acid, AcO and AcONa give 4-(6-methoxybenzylidene)-2-phenyl-5-oxazolone (I), yellow, m. 160°. I with d. NaOH gives  $\alpha$ -benzamidop-methoxycinnamic acid, m. 225° (decomp.). Its ester (II), from I and d. NaOH in MeOH, m. 153°. II and N<sub>2</sub>H<sub>4</sub>·H<sub>2</sub>O in EtOH yield  $\alpha$ -benzamidop-methoxycinnamoyl hydrazide A (III), m. 235°; with HCHO it yields a microcryst. product m. 190°; addn. of H<sub>2</sub>O to a soln. contg. yellow HgO in EtOH gives a ppt. m. 133° (decomp.). *Ac deriv.* of III, m. 248°. I with an excess of N<sub>2</sub>H<sub>4</sub>·H<sub>2</sub>O in EtOH gives hydrazide B (IV), with 1 mol. H<sub>2</sub>O, m. 173°. *Ac deriv.* of IV, m. 215°. IV gives the following condensation products with aldehydes in EtOH: HCHO, m. 120° (decomp.); BzH, C<sub>6</sub>H<sub>5</sub>N<sub>2</sub>O<sub>2</sub>, m. 212°;  $p$ -MeOC<sub>6</sub>H<sub>4</sub>CHO, C<sub>6</sub>H<sub>5</sub>N<sub>2</sub>O<sub>2</sub>, m. 233°; AcH, C<sub>6</sub>H<sub>5</sub>N<sub>2</sub>O<sub>2</sub>, m. 190°. III results from I and N<sub>2</sub>H<sub>4</sub>·H<sub>2</sub>O in boiling EtOH. III with NaNO<sub>2</sub> in d. HCl gives azide A, m. 127° (decomp.); azide B, m. 110° (decomp.). Azide B in boiling EtOH gives I and with PhNH<sub>2</sub> yields the *anilide*, C<sub>6</sub>H<sub>5</sub>N<sub>2</sub>O<sub>2</sub>, m. 232°; the latter results also from I in boiling PhNH<sub>2</sub>. Azide A yields only resinous material with EtOH and does not form an anilide. III with Br vapor yields a *Br deriv.*, m. 210° (decomp.); with Br IV gives HBr and a *Br deriv.*, m. 310-11°. IV in AcOEt and Br gives I. III and PhNCO in C<sub>6</sub>H<sub>6</sub> give a *semicarbazide*, m. 225°; the *semicarbazide* of IV m. 205°. It is assumed that III and V are geometrical isomers; in III there is a steric hindrance because of the relation of the C<sub>6</sub>H<sub>5</sub> nucleus and the hydrazine group, whereas in V the latter groups can react freely. This isomerism may be explained also by the assumption of a dynamic equil. between an open and a cyclic form through wandering of a H atom; the cyclic form IV is an azide.

product of N<sub>2</sub>H<sub>4</sub> to I which, under energetic conditions, is transformed into III by the opening of the ring.



**II. The action of hydrazine hydrate on oxazolones.** Mihail Vanghelovici and Aurora Stefanescu. *Ibid.* 159-81. — A study is reported of the effect of substituents in the C<sub>6</sub>H<sub>5</sub> nucleus upon the action of N<sub>2</sub>H<sub>4</sub>·H<sub>2</sub>O upon the following: benzylidene-2-phenyl-5-oxazolones, RCH=C(N:CPh)O.CO,

in which R is Ph (I),  $p$ -MeC<sub>6</sub>H<sub>4</sub> (II),  $o$ - (III),  $m$ - (IV) and  $p$ -O<sub>2</sub>NC<sub>6</sub>H<sub>4</sub> (V). The results do not support the assumption that the 2 hydrazides are geometrical isomers. The isomeric hydrazide is probably a simple azide, product of N<sub>2</sub>H<sub>4</sub> to the oxazolone (VI); this constitution is supported by the formation of the isomeric hydrazide B from the oxazolone and concd. N<sub>2</sub>H<sub>4</sub>·H<sub>2</sub>O at room temp. and the formation of the oxazolone on long standing in the air; it is also supported by the formation of the oxazolone from the azide on boiling in EtOH, a reaction which is spontaneous in the case of V. III does not yield a hydrazide A



with  $N_2H_4 \cdot H_2O$  but forms a resinous product which contains  $o-O_2NC_6H_4Me$ ; on the other hand, III with NaOH and MeOH gives the corresponding unsatd. acid. The formation of hydrazide B, the azide, the anilide, etc., proceeds normally. V and  $N_2H_4 \cdot H_2O$  do not form a hydrazide but a compd. of unknown structure with a high N content. Hydrazide A of V was formed indirectly from the Me ester of the unsatd. acid. IV behaves as I. BaH, hippuric acid, AcO and AcONa, on heating on the water bath, give 4-benzylidene-2-phenyl-5-oxazolone (I), m. 106-7°. I and 80%  $N_2H_4 \cdot H_2O$  in EtOH give the hydrazide B (VII) of I, m. 153-4°; this also results with 99.9%  $N_2H_4 \cdot H_2O$  at room temp. Boiling I with concd.  $N_2H_4 \cdot H_2O$  gives benzamidocinnamoyl hydrazide (hydrazide A) (VIII), m. 229°. I with NaOH in MeOH gives Me benzamidocinnamate (IX), needles which become opalescent in polarized light at 112° and clear at 123°; the free acid m. 236°. Boiling IX with concd.  $N_2H_4 \cdot H_2O$  gives VIII. The Ac deriv. of VII m. 208°, that of VIII m. 172° (decompn.). VII yields a condensation product, m. 221°, with BaH; VIII does not condense with aldehydes. VIII yields an azide, m. 105° (decompn.); boiling  $PhNH_2$  gives an anilide, m. 237°; the same anilide results from I and  $PhNH_2$ . The azide in boiling EtOH yields I.  $p-MeC_6H_4CHO$  gives II, yellow, m. 141-2°; concd.  $N_2H_4 \cdot H_2O$  gives the hydrazide B (X), m. 188° (decompn.). II, boiled with  $N_2H_4 \cdot H_2O$  in EtOH, gives  $p$ -methylbenzamidocinnamoyl hydrazide (hydrazide A) (XI), m. 245°. II with NaOH in MeOH gives Me  $p$ -methylbenzamidocinnamate, m. 135°; with  $N_2H_4 \cdot H_2O$  it yields XI. The Ac deriv. of X m. 208°; that of XI m. 237°. X and BaH yield a condensation product m. 238°. II with  $NaNO_2$  and HCl gives an azide,

m. 108° (decompn.), which yields an anilide, m. 235°. The azide in boiling EtOH gives II.  $o-O_2NC_6H_4CHO$  gives III, yellow, m. 166°; the hydrazide B (XII), m. 174°.  $o$ -Nitrobenzamidocinnamic acid, m. 195°, is formed from III and NaOH in MeOH. XII yields an Ac deriv., m. 212°. XII forms an azide, m. 115° (decompn.), which gives III with EtOH and yields an anilide, m. 215°. XII and BaH form a condensation product, m. 187°. IV m. 174°; hydrazide B (XIII), yellow, m. 195° (Ac deriv., m. 212°); BaH product, m. 210°.  $m$ -Nitrobenzamidocinnamoyl hydrazide (hydrazide A of IV) (XIV), m. 210° (Ac deriv., m. 242°). Me  $m$ -nitrobenzamidocinnamate, from IV and NaOH in MeOH, m. 166°; with  $N_2H_4 \cdot H_2O$  it gives XIV. XIII yields an azide (decompn. 80°), which gives IV with EtOH and an anilide, m. 222°. V m. 234°; hydrazide B (XV), yellow, m. 180° (Ac deriv., m. 145°); BaH condensation product, m. 215°. Me  $p$ -nitrobenzamidocinnamate, m. 190°; hydrazide, m. 256° (Ac deriv., m. 205°). XV forms an azide, decompn. 136°; on standing a short time it spontaneously gives V;  $PhNH_2$  gives an anilide, m. 157°. Through Chem. Zentr. 1943, II, 1275-7. C. J. W.

R. A. M.

VANOHELOVICI (M.) & SERBAN (FELICIA). The influence of organic media on the composition of *Aspergillus niger*.—*Bull. Sect. sci. Acad. roum.*, xxv, pp. 157-164, 1942. [Abs. in *Chem. Abstr.*, xxxviii, 19, p. 5253, 1944.]

When *Aspergillus niger* is grown on a mineral substratum in which glycerol replaces glucose as the sole source of carbon, marked changes occur in the composition of the mould in respect of total lipoids, nitrogen, pigments, and ash. Such modifications, however, are purely temporary, since on re-transference to a glucose medium the glycerol cultures reassume their original properties as regards colour, friability, and composition. This variation is interpreted as the first step in the direction of a true mutation [cf. *R.A.M.*, xxi, p. 468], such as is effected by certain toxic substances, e.g., colchicin, camphor, and acenaphthene, or by X-rays, and is likewise associated with well-marked alterations in the composition of the fungus. Thus the presence of harmless substances in the soil may play an important part in the development of a new species.

VANGHELOVICI, M.; LUPSA, I.; BILEGAN, C.; MUSTE, A.

Syntheses in the field of oxazolones. V. Condensation of oxazolones with p-aminobenzenesulfonamide, ethanolamine and anesthesine. Studii chim Timisoara 6 no.3/4:103-110 JI-D '59. (EEAI 10:4)

1. Comitetul de redactie, Studii si cercetari stiinte chimice,  
redactor responsabil adjunct (for Vanghelovici)  
(Oxazolones) (Metanilamide) (Aminoethanol)  
(Benzocaine)

VANGHELOVICI, M., prof.; DEMETRESCU, Catalina

Syntheses in the field of spasmolytic drugs. I. Synthesis of some new active substituted hydrazides. Studii mat Timisoara 7 no.1/2: 157-168 Ja-Je '60. (EEAI 10:4)

1. Laboratorul de Biochimie al Institutului de Medicina, Timisoara, laboratorul de farmacologie al Institutului de Medicina si Farmacie, Bucuresti. 2. Comitetul de redactie, Studii si cercetari, Stiinta chimice, Baza de cercetari stiintifice Timisoara, redactor responsabil adjunct (for Vanghelovici)

(Antispasmodics)

(Drugs)

(Hydrazides)

VANGHELOVICI, M., prof.; LUPSA, I.; BILEGAN, C.; MUSTE, A.

Syntheses in the field of oxazolones. VI. Condensation of p-amino-hippuric acid with aromatic aldehydes in the presence of acetic anhydride. Studii chim Timisoara 7 no.3/4:295-302 J1-D '60.  
(EEAI 10:9/10)

1. Comitetul de redactie, "Studii si cercetari stiinte tenice," Timisoara, redactor responsabil adj. (for Vanghelovici).

(Oxazolinone) (Aminohippuric acid) (Aldehydes)  
(Aromatic compounds) (Acetic anhydride)

VANGHELOVICI, M., prof.; DEMETRESCU, C.

Syntheses in the field of oxazolones. VII. Condensation of oxazolones with various hydrazides, and preparation of some new derivatives with antituberculous action. Studii chim Timisoara 8 no.1/2:79-88 Ja-Je '61.

1. Comitetul de redactie, Studii si cercetari, stiinte chimice [Academia Republicii Populare Romine, Baza de Cercetari Stiintifice Timisoara], redactor responsabil adjunct (for Vanghelovici).

(OXAZOLONES) (HYDRAZIDES) (BACTERICIDAL ACTION)  
(TUBERCULOSIS)



VANGHELOVICI, M., prof.; DEMETRESCU, C.; MUSTE, A.

Syntheses in the field of oxazolones. VIII. Preparation of some new substituted hydrazides through the opening of the oxazolonic cycle. Studii chim Timisoara 8 no.1/2:89-97 Ja-Je '61.

1. Comitetul de redactie, Studii si cercetari, stiinte chimice [Academia Republicii Populare Romine, Baza de Cercetari Stiintifice Timisoara], redactor responsabil adjunct (for Vanghelovici).

(Oxazolones) (Hydrazides) (Cyclic compounds)

42945

S/081/62/000/022/021/038  
B144/B101

5.3610

AUTHORS: Vanghelovici, M., Demetrescu, Cătălina

TITLE: Synthesis in the field of spasmolytic substances. II.  
Synthesis of new active substituted hydrazides and study of  
the relation between structure and physiological effect

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 22, 1962, 221, abstract  
22Zh214 (Studii și cercetări științe chim. Acad. RPR.  
Baza Timișoara, v. 8, nos. 1-2, 1961, 99-108 [Rum.;  
summaries in Russ. and French])

TEXT: By reaction of the hydrazides  $RCONHNH_2$  with the chloroamines  
 $ClCH_2CH_2NR'_2$ , the compounds  $RCONHNHCH_2CH_2NR'_2$  (I) were synthesized; these  
have a considerable spasmolytic effect which is explained by the analogy  
between the structures of I and of papaverine with cleaved isoquinoline  
ring. When  $RCONHNH_2$  is condensed with  $p-(CH_3)_2NC_6H_4CHO$  in  $CH_3COOH$  in the  
presence of alcohol, the acyl hydrazones  $RCONHN-CHC_6H_4N(CH_3)_2-p$  are ob-

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Synthesis in the field of ...

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tained (R, gross formula, and m.p. in °C are specified):  $(C_6H_5)_2CH$ ,  $C_{23}H_{23}ON_3$ , 178 (from alcohol);  $C_6H_5CH=CH$ ,  $C_{18}H_{19}ON_3$ , 185 (from alcohol). To 4.5 g  $C_6H_5CH_2CONHNH_2$  dissolved in 50 ml iso- $C_3H_7OH$  the solution of  $ClCH_2CH_2N(C_2H_5)_2$  (from 5.6 g hydrochloride) in 50 ml  $C_6H_6$  is added, the mixture is kept for 9 hrs at 100°C, the solvent is distilled off, the residue is dissolved in a minimum volume of anhydrous  $C_6H_6$ , it is then saturated with dry HCl and after 24 hrs the hydrochloride of I (R =  $C_6H_5CH_2$ , R' =  $C_2H_5$ ),  $C_{14}H_{23}ON_3 \cdot HCl$ , is separated, m.p. 197°C (from alcohol-ether). The hydrochlorides of the following I are analogously synthesized (R, NR<sub>2</sub>, brutto formula, and m.p. in °C are specified):  $C_6H_5CH_2$ , N <  $(CH_2CH_2)_2$  > O,  $C_{14}H_{21}O_2N_3 \cdot HCl$ , 193;  $(C_6H_5)_2CH$ , N  $(C_2H_5)_2$ ,  $C_{20}H_{27}ON_3 \cdot HCl$ , 182;  $(C_6H_5)_2CH$ , N-piperidyl,  $C_{21}H_{27}ON_3 \cdot HCl$ , 187;  $(C_6H_5)_2CH$ , N <  $(CH_2CH_2)_2$  > O,  $C_{20}H_{25}O_2N_3 \cdot HCl$ , 135;  $C_6H_5CH=CH$ , N  $(C_2H_5)_2$ ,  $C_{15}H_{23}ON_3 \cdot HCl$ , 194;  $C_6H_5CH=CH$ , N-piperidyl,  $C_{16}H_{23}ON_3 \cdot HCl$ , 206;

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Synthesis in the field of ...

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B144/B101

$C_6H_5CH=CH$ ,  $N<(CH_2CH_2)_2>O$ ,  $C_{15}H_{21}O_2N_3 \cdot HCl$ , 181;  $(C_6H_5)_2(OH)C$ ,  
 $N<(CH_2CH_2)_2>O$ ,  $C_{20}H_{25}O_3N_3 \cdot HCl$ , 215. Part I see RZhKhim, 1961, 22Zh152.  
[Abstracter's note: Complete translation.]

Card 3/3

VANGHELOVICE, M., prof; LUPSA, I.; BILEGA", C.; MUSTE, A.

Synthesis in the domain of oxazolones. IX. Action of cyclohexylamine and ethylenedamine on oxazolones. Studii chim Timisoara 8 no. 3/4: 249-254 JI-D '61.

1. Membru al Comitetului de redactie si redactor responsabil adjunct, "Studii si cercetari, Stiinte chimice" (Timisoara) (for Vanghelovici)

VANGHELOVICI, <sup>M.</sup> porf., dr.

The International Congress of Biochemistry; Moscow, August 1961.  
Studii chim Timisoara 9 no.1/2:179-181 Ja-Je '62.

1. Membru al Comitetului de redactie si redactor responsabil  
adjunct, "Studii si cercetari, Stiinte chimice" - Timisoara.

VANGHELOVICI, M.; DEMETRESCU, Catalina

Studies on the oxazolone series. Pts 10-11. Studii chim Timisoara  
9 no.3/4:291-307 J1-D '62.

1. Laboratorul de Chimie al Institutul de Medicina Timisoara.  
Laboratorul de Farmacologie al Institutului de Medicina si  
Farmacie Bucuresti.

VANGHELOVICI, M.

1. "The Ninth Edition of the USSR Pharmacopoeia," Part 1, Moscow, 1961, from Ing. P. S. G. and from P. S. G. (Bureau), pp. 65-76.
2. "The Position of Catechol in the Enthalpy Complex of the Phenol," Part 1, from Ing. P. S. G. and from P. S. G. (Bureau), pp. 77-79.
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RUMANIA

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Chemistry Laboratory, Institute of Medicine in Timisoara  
(Laboratorul de chimie, Inst. Med. Timisoara) - (for all)

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S/079/62/032/001/002/016

D205/D302

5.3700  
AUTHORS:

Chernyshev, Ye.A., and Vangnits, Ye.V.

TITLE:

Interaction of silanes with aromatic compounds in liquid phase in the presence of boron trichloride

PERIODICAL:

Zhurnal obshchey khimii, v. 32, no. 1, 1962, 24 - 29

TEXT: The reaction between silanes and aromatic compounds in the presence of catalysts of the Lewis acid type was investigated to explore its potentialities for preparing silicoorganic compounds containing polycyclic aromatic radicals and also two silyl substituents in the aromatic ring. The reactants were heated with 1 %  $\text{BCl}_3$  for 6 hours at  $300^\circ\text{C}$  in a 1 l. steel rotating autoclave. After cooling, the residual pressure was 30 atm. Interaction of diphenyl (1 part) with trichlorosilane (2 parts) at  $300^\circ\text{C}$  in the presence of  $\text{BCl}_3$  gave a 28.5 % yield of monosilyl substitutes and 7.6 % yield of disilyl substitutes. The 1 : 4 respective ratio of reactants gave a 31.2 % yield on monosilyl and 20.7 % of the disilyl substitu-

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## Interaction of silanes with ...

tes. The crystalline monosilyl derivatives were methylated to liquid xenyl trimethylsilanes, for which the silylation, as shown by the infra-red spectra, was ~50 % in the meta- and ~50 % in the para-position. It was also determined spectrally that two trichlorosilyl groups are bonded to different rings of the diphenyl molecule. Terphenyl could not be reacted under any conditions. m-Diphenylbenzene could, however, be reacted with a yield of 3.3 and 7.5 % with trichlorosilane and methyldichlorosilane respectively. The reaction of benzene with trichlorosilane in 1 : 4 ratio in conditions similar to those of the diphenyl reaction gave 44.8 % of phenyltrichlorosilane and 9.2 % hexachloro-disilyl benzene. The twofold decrease in the yield of disilyl substitutes as compared with the diphenyl reaction is explained by the reduction in the reactivity of the ring caused by introduction of the electronegative trichlorosilyl group into the benzene molecule. The second silyl group in the diphenyl enters the second ring where the influence of the first silyl group is much weaker. The reaction of trichlorosilane (2 parts) with phenyltrichlorosilane (1 part) at 300°C gave a 18.3 % yield of hexachlorodisilylbenzene. At the same ratio of methyldichlorosilane

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## Interaction of silanes with ...

with phenylmethyldichlorosilane, the yield of bis-(methyldichlorosilyl)-benzene was 11 %. Spectral analysis of both products showed that they were mainly the meta-isomers. This formation of mainly meta-isomers is attributed to the activity of the electrophilic siliconium ions  $\text{Cl}_3\text{Si}^+$ , considered to be higher than that of the car-

bonium ions which are the most active of the previously investigated electrophilic particles. The meta-isomer can also be formed by secondary processes. Thus, when heated at  $250^\circ\text{C}$  in the presence of  $\text{BCl}_3$  and traces of  $\text{HSiCl}_3$ , p-tolymethyldichlorosilane was isomerized in 50 % yield to the meta-isomer. The nature of the substituents has a bearing on the velocity of the reaction. The relative reactivities of benzene and toluene in the reaction were determined by using an equimolar mixture of benzene, toluene and trichlorosilane. At  $250^\circ\text{C}$  during 8 hours, the benzene reacted in 33 % and the toluene in 42 % yields. Thus, the introduction of an electron donor substituent activates the ring, while the introduction of an electron acceptor substituent passivates the ring. The experimental data, therefore, suggest an electrophilic mechanism. There are 1 table

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ASSOCIATION: Institut organicheskoy khimii im. N.D. Zelinskogo Akademii Nauk SSSR i Moskovskiy khimiko-tekhnologicheskoy institut im. D.I. Mendeleyeva (Institute of Organic Chemistry, im. N.D. Zelinskiy, AS USSR and Moscow Institute of Chemical Technology im. I.D. Mendeleyev) ✓

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properties of the investigated compound

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii